



## BOOK OF ABSTRACTS

- I. SESSION DESCRIPTION
- II. SESSION PROGRAM
- III. ABSTRACTS

### I. SESSION DESCRIPTION

**ID: O3**

Teaching ecosystem services around the globe – your lessons learnt

**Hosts:**

	Name	Organisation	E-mail
<b>Host:</b>	Nina Schwarz	University of Twente	<a href="mailto:n.schwarz@utwente.nl">n.schwarz@utwente.nl</a>
<b>Co-host(s):</b>	Marija Bockarjova Wieteke Willemen	University of Twente University of Twente	<a href="mailto:m.bockarjova@utwente.nl">m.bockarjova@utwente.nl</a> <a href="mailto:l.l.willemen@utwente.nl">l.l.willemen@utwente.nl</a>

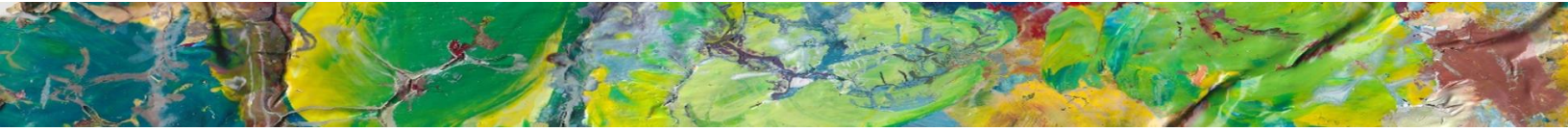
**Abstract:**

Many of us are teaching and give training about ecosystem services (ES), and know this is a non-trivial task. In this hands-on session, we aim at collecting tips on learning methods, formats and materials, identifying key challenges, implications from teaching for our own research and sharing lessons learnt about the dos and don'ts of teaching ecosystem services. Teachers involved in teaching at universities, schools, training professionals and in other contexts are invited! We hope to learn from each other and inspire participants for their own teaching.

Presenters can either talk about a course they are teaching, designing a course or (re-)evaluating their teaching. We encourage diverse types of contributions, such as pitching the challenges in ES teaching and the lessons learnt, or getting feedback from the audience by giving a mini lecture (10min) or an interactive unit to teach a certain concept or method related to ecosystem services, sharing perspectives on education approaches in the context of ES (Open Education, Inclusion). The aim is to learn together.

Do you want to join us? Submit your 'abstract' indicating the topic you want to present or get feedback on, and for what the audience is of your training/teaching, include any weblink you feel is useful to share (syllabus, video, learning outcomes).

**Goals and objectives of the session:**



Participants find inspiration in the range of examples how the ecosystem services concept is taught in different settings. Presenters can receive feedback on their talks / teaching units.

### Planned output / Deliverables:

A collection of challenges faced when teaching ecosystem services in different contexts and a list of lessons learnt. Challenges and lessons learnt could be published as a position paper if participants are interested.

## II. SESSION PROGRAM

**Room:** Expert Street 2

**Date of session:** 18<sup>th</sup> of November 2024

**Time of session:** 16:00–17:30

### Timetable speakers

Time	First name	Surname	Organization	Title of presentation
16:00	Davina	Vačkářová	Global Change Research Institute of the Czech Academy of Sciences	Teaching Ecosystem Services: Insights from a Decade of Course Curricula, Exercises, and Pedagogical Lessons
16:10	Alexander	van Oudenhoven	Leiden University	Teaching ecosystem services to an interdisciplinary and critical student population
16:20	Monika	Leuenhagen	Bielefeld University	How can the ecosystem services approach contribute to interdisciplinary teaching?
16:30	Nina	Schwarz	University of Twente	Design and development of accessible e-learning materials on urban green spaces in the tropics.
16:40	Francesc	Baró	Vrije Universiteit Brussel	Greening the City: Teaching Ecosystem Services in Urban Studies
16:50	Marija	Bockarjova	University of Twente	Teaching ecosystem services: understanding their value
17:00	Fiorella	Iaquinta	Universidad de la República	Intersection of the ecosystem approach to human health (Ecohealth) and Latin American extension traditions: teaching experiences in health-environmental issues
17:10	<a href="#">Click here to enter text.</a>	ALL	<a href="#">Click here to enter text.</a>	Discussion on challenges and ways forward



### III. ABSTRACTS

*The first author is the presenting author unless indicated otherwise.*

## **1. Greening the City: Teaching Ecosystem Services in Urban Studies**

*First author(s):* Francesc Baró

*Other author(s):* Elsa Gallez, Amy Phillips

*Affiliation:* Vrije Universiteit Brussel (VUB)

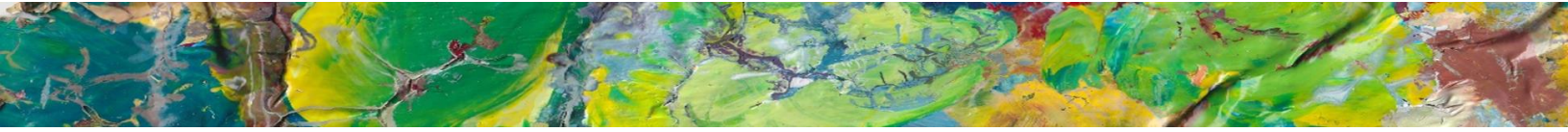
*Contact:* francesc.baro@vub.be

Greening the City is a 6 ECTS course offered in the VUB MSc programs in Urban Studies, Geography, and Spatial Planning and Urban Design since the academic year 2021–2022. Students have very diverse educational and international backgrounds as the Urban Studies and Geography programs are highly interdisciplinary and taught in English.

One of the main learning goals of the course is that students master state-of-the-art theories, concepts, and ideas from urban ecology, with a focus on (urban) ecosystem services, green infrastructure and nature-based solutions. Students also get familiar with methodological approaches and tools for assessing urban nature and its benefits to urban residents (e.g., there is a hands-on session on i-Tree Eco) and develop a critical view on urban greening policies through the lenses of environmental justice scholarship.

The course loosely builds on a “flipped classroom” approach combining traditional lectures with student-led presentations and debates. In these debates, students are asked to review mandatory readings and other materials critically, and to share and discuss their insights with each other. The evaluation is based on the quality of these presentations and debates and two assignments: a short blogpost/media piece intended for a wide (non-academic) audience (all are available online from this site: <https://greeningthecityvub.wordpress.com/>) and an individual essay on a well-researched topic related to the course contents (a few students have even managed to publish their essay in the “Nature of Cities” platform – <https://www.thenatureofcities.com/essays/>).

In this session, we would like to share our lessons learnt from the first three editions of this course, based on the lecturers’ experiences, as well as the students’ feedback on what has worked and what could be improved. We are also happy to receive feedback/ideas from other



colleagues teaching (urban and non-urban) ES courses and engage in a discussion on key challenges and how we could address them.

*Keywords:* urban ecology, urban ecosystem services, urban environmental justice, flipped classroom, lessons learned

## **2. Teaching ecosystem services: understanding their value**

*First author(s):* Marija Bockarjova

*Other author(s):* Wieteke Willemen, Nina Schwarz

*Affiliation:* University of Twente

*Contact:* m.bockarjova@utwente.nl

Educating a new generation of academics and practitioners on the ecosystem services (ESS) and their value is essential for future nature-inclusive and well-informed societies. At the University of Twente (UT, the Netherlands), we offer a dedicated elective course on ecosystem services as benefits to people. From a teacher's perspective, it involves a range of methods to convey the economic, ecological, and intrinsic values of ESS. These methods include traditional lecturing introducing multiple perspectives on value, inviting guest speakers, and organizing visits to natural sites to observe ecological interventions firsthand. These approaches help deepen understanding and articulation of how ecosystems and human society are intertwined. In addition, we use the InVEST (Integrated Valuation of Ecosystem Services and Tradeoffs) tool, which allows students to apply theoretical knowledge to real-world scenarios. This hands-on experience helps them understand the process of identifying, mapping, quantifying and monetizing selected ecosystem services, making the learning process more tangible and relevant. While tools like the InVEST model are valuable for applying and visualizing ESS concepts, the broader goal of ESS education is to instill a deep understanding and appreciation of the essential services ecosystems provide and the importance of their preservation. Balancing economic valuation with broader ecological and intrinsic values, we aim at promoting responsible environmental stewardship. By adopting this combined approach to ESS education, we aim at students developing understanding, critical thinking and problem-solving skills, preparing them for informed decision-making in their future profession.

*Keywords:* Value typologies; educational methods; InVEST tool



### **3. Intersection of the ecosystem approach to human health (Ecohealth) and Latin American extension traditions: teaching experiences in health-environmental issues**

*First authors(s):* Fiorella Iaquina

*Other author(s):* Patricia Iribarne

*Affiliation:* Faculty of Chemistry, Universidad de la República

*Contact:* fiaquina@fq.edu.uy

Nowadays there is a conscious concern about the relationship between environment, society and human health. Evidence of the environmental problems is increasing, as is the loss of ecosystems functions and services that are essential for human well-being. This preoccupation has gained great importance in social, political and academic spheres. Transcending traditional health-environment approaches implies to connect aspects linked to environmental management and determinants of health, within a framework of holistic understanding and political action. This way of thinking must be introduced in the early stages of the academic journey. Like other universities in the region, Universidad de la República has claim Latin American extension traditions and generated changes in the study plans of undergraduate students introducing this approach into academic training. It presents territorial, participatory, transdisciplinary and critical thinking research concepts for the collective approach to problems of social interest. In this context, we present how from natural sciences we are introducing these concepts to our students and how to take them into action. Through different programs the intersection of the ecosystem approach to human health (Ecohealth) and Latin American extension traditions are presented. The aim is to provide elements for a comprehensive approach to health-environment problems in territories. Besides, train university students who are critical and committed to social problems. Finally, we want to present opportunities and challenges linked to this intersection. The potential to resize the health processes of other university functions mediated by action and by solving in conjunction with social actors could be an opportunity. Challenges are related to transdisciplinary dimension, as well as to the time required to generate change in society in this kind of process. We hope that our teaching experience help others to introduce holistic approaches to students, allowing them to link health and environment, generate knowledge and transform it into actions.

*Keywords:* EcoHealth, Latin American Extension, Natural Sciences, Education



#### **4. How can the ecosystem services approach contribute to interdisciplinary teaching?**

*First author(s):* Stefanie H. Boltersdorf

*Other author(s):* Monika Leuenhagen, Stephan Unger, Nils Hasenbein

*Affiliation:* Faculty of Biology, Bielefeld University, Germany

*Contact:* monika.leuenhagen@uni-bielefeld.de

Land use and pressure on ecosystems continue to increase, even in times of crisis and conflict. Land use often needs to be planned on a multifunctional basis to protect species, habitats and environmental media, and to take into account the different social perspectives and needs of those involved.

Students who will be working on solutions to these conflicts in the future will need in-depth knowledge of how to identify and assess the state of ecosystems and the impact of projects that cause ecosystem degradation. They also need an interdisciplinary overview to be able to consider the different social perspectives on the changing use of the environment. Students should also be able to actively and appropriately apply and implement such knowledge and skills to plan suitable nature-based interventions.

Some experience of how these objectives can be achieved is already available from courses in environmental science, landscape analysis and ecology, or the application of geographic information systems, where students work on topics related to the adaptations and transformations required in urban and rural areas in the context of global change. Important aspects include collaboration with researchers from other disciplines and practitioners, scenario-based learning and the integration of practical teaching through fieldwork and excursions.

The potential benefits of considering ecosystem services (ES) as a protected good and integrating them in the context of planning have already been described. The concept of ES can also be further integrated into teaching: building on ES as a framework concept to describe ecosystem services also from the perspective of the economy, health, education, tourism and other social systems, interdisciplinarity and diversity of perspectives can be anchored in theory. We present conceptual ideas, experiences and challenges as a basis for discussion.

*Keywords:* Applied teaching, Landscape analysis, Ecosystem services, Interdisciplinarity, Scenario-based learning



## 5. Design and development of accessible e-learning materials on urban green spaces in the tropics.

*First author(s):* Nina Schwarz

*Other author(s):* Louise Willemen

*Affiliation:* University of Twente

*Contact:* n.schwarz@utwente.nl

What do urban planners and managers need to know about the role of nature in the context of urban planning challenges worldwide, especially in the tropics? This is the overarching question our e-learning module on urban green spaces is covering. Our e-module provides open and accessible digital learning materials for higher education and professional training, that can be given as a standalone course of about 40 hours or within a course. The learning materials consist of micro-lectures, reading, quizzes and practical exercises. We developed the course for a project on urban green in Paramaribo, Suriname ([www.groenparamaribo.org](http://www.groenparamaribo.org)).

We share our insights on course design, implementation and evaluation focusing on the open and accessible character. For design, we followed the Arena Blended Connected (ABC) curriculum design approach. For each learning activity, the ABC approach provides a list of digital technologies (e.g., acquisition by video or animation), making us aware of the options we had.

For implementation, we expected our target audience not to have reliable internet connection. Therefore, we implemented the course so that it can be used offline which limited options for interactivity. We used the free and open source tool eXeLearning (<https://exelearning.net>) as platform for our learning materials. Our choice to share the e-module under a creative commons license limited our options for reading materials, especially older papers which were not openly accessible or sharable.

Developing teaching materials is a team effort. For example, university teachers in Suriname provided feedback after the initial design. Students checked the materials for clarity and time required. Throughout the process, we also received support from colleagues who facilitated the course design, moved materials into eXeLearning, went over all scripts and helped recording the micro-lectures. The course is accessible under <https://doi.org/10.5281/zenodo.6907816>.

*Keywords:* Urban ecosystem services, education, e-learning, evaluation, tropics



## **6. Teaching Ecosystem Services: Insights from a Decade of Course Curricula, Exercises, and Pedagogical Lessons**

*First author(s):* Davina Vackarova

*Affiliation:* Global Change Research Institute of the Czech Academy of Sciences

*Contact:* [vackarova.d@czechglobe.cz](mailto:vackarova.d@czechglobe.cz)

This contribution focuses on over a decade of accumulated experiences and knowledge in teaching ecosystem services at Charles University in Prague, Czechia. It highlights the evolution of the course curricula, showcasing various exercises and teaching methodologies designed to deepen students' understanding of ecosystem services, including its scientific basis, methods, and practical applications. Developed since 2012, this elective course for environment and geography students at the Faculty of Science has continuously evolved, with ongoing improvements enhancing its effectiveness.

The presentation will also address the challenges encountered, such as the multidisciplinary nature of the topic, and provides a brief reflection on potential obstacles. Additionally, it will discuss the accessibility of teaching materials, emphasizing the use of international reports, scientific papers, and other resources like videos and news articles. By sharing selected experiences and exercises, this contribution aims to offer examples and inspiration for educators teaching ecosystem services, fostering improved teaching practices and student engagement.

*Keywords:* Ecosystem services, Environmental education, Hands-on Exercises, Interdisciplinary learning, Curriculum development

## **7. Teaching ecosystem services to an interdisciplinary and critical student population**

*First author(s):* Alexander van Oudenhoven

*Affiliation:* Institute of Environmental Sciences (CML), Leiden University

*Contact:* [a.p.e.van.oudenhoven@cml.leidenuniv.nl](mailto:a.p.e.van.oudenhoven@cml.leidenuniv.nl)

The role of and framing of the ecosystem services concept has changed substantially over time. Dealing with these changes is particularly challenging in higher education, especially when courses are to be repeated yearly in a fixed curriculum. As one of the many themes in sustainability sciences, the concept evolves continuously, continues to receive criticism and





actually deals with a topic bigger than itself: human–nature relations and the multiple values involved. Here, I would like to share how I have dealt with challenges related to a changing concept in higher education. I will do so in the context of a dedicated BSc course on the topic Ecosystem Services and a MSc course on the science–policy interface of biodiversity, both at Leiden University.

The BSc course is structured along the fairly traditional DPSIR–based ‘cascade model’, widely used to conceptualize and analyse ecosystem services. In the MSc course, the concept is the topic of one week, embedded in a much broader framework and assignment. Here, it is up to the students to use it, depending on the context and whether they find it appropriate for addressing their research challenge.

Several recurring issues have emerged when teaching on ecosystem services. First, it is crucial to embed this teaching in the wider context of the multiple values of nature. Also, when students have different backgrounds, their perspectives on the concept differs wildly prior to teaching them. Also, embedding the concept explicitly in the science–policy interface makes it more tangible to students, beyond merely a concept on paper. Finally, I would argue that repeatedly teaching on ecosystem services forces the teacher to continuously rethink and critically evaluate the very concept. This is something I hope every scholar can experience every now and then.

*Keywords:* science–policy interface, IPBES, values, ecosystem services, education